



## PSS Business Models

A workbook in the PROTEUS series

**Andersen, Jakob Axel Bejbro; McAloone, Tim C.; Garcia i Mateu, Adrià; Mougaard, Krestine; Neugebauer, Line Maria; Hsuan, Juliana; Ahm, Thorkild**

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# #7

# PSS BUSINESS MODELS

A workbook in the PROTEUS series



1

**Maritime Branch Analysis** A deep dive into the maritime industry in Denmark through the lens of our twelve partner companies. This report is the outcome of the descriptive exploratory phase of PROTEUS. ISBN: 978-87-90416-87-4

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## 7 PSS Business Models

# WHAT IS IN THIS BOOK?

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In this final PROTEUS workbook, the important topic of business models is presented, with the objective of guiding the reader towards the creation of profitable and viable businesses, based on the ideas that lie within PSS. The book starts by discussing the commercial reasons for pursuing business models, with their basis in PSS thinking, both in the eyes of the supplier as well as the customer. The drivers behind profitable and viable business models are treated, especially the importance of changing the perspective on needs and optimising the impact of the PSS portfolio. The customer and supplier perspective are framed, with a description and discussion of general prerequisites for business models in the maritime branch. In the next section of the workbook, a deeper dive is taken into the customer's perspective and a number of new customer-specific prerequisites for PSS business models are explained. In rounding off the background for maritime business models, the workbook goes on to describe how 3rd party stakeholders can be introduced as enablers. Having established an understanding of the background for business models, the workbook proceeds to elucidate how new PSS business models can be created, in cooperation between the customer and supplier. A basis for describing business models is briefly introduced (the well-known Business Model Canvas) and on this basis, a catalogue of novel PSS business models is provided. These PSS business models are meant to inspire and provoke the stakeholders of the maritime branch, towards new and profitable ways of doing business. The final pages of the workbook provide a template for the reader to create own new business models, based on the contents of the book.

## **PSS Business Models**

A workbook in the PROTEUS Series

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Authors: Jakob Bejbro Andersen, Tim C. McAloone, Adrià Garcia i Mateu, Krestine Mougaard, Line Neugebauer, Juliana Hsuan and Thorkild Ahm.

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E-book version and more information at [www.dtu.dk/proteus](http://www.dtu.dk/proteus)

# CONTENTS

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<b>THE PROTEUS INNOVATION CONSORTIUM</b>	<b>4</b>
Introducing PROTEUS	6
What is PSS	8
<b>MARITIME BUSINESS MODELS</b>	<b>10</b>
Building a Business on PSS	12
PSS Business Models Benefits	14
Profitability and Business Sustainability	16
<b>THE BUSINESS MODEL ECOSYSTEM</b>	<b>18</b>
Market Structure and Barriers	20
The Customer Perspective	22
The Role of Non-Maritime Stakeholders	26
<b>CO-DEVELOPMENT OF BUSINESS MODELS</b>	<b>28</b>
<b>A CATALOGUE OF PSS BUSINESS MODELS</b>	<b>34</b>
A Framework for Describing Business Models	38
Multi-Ride Ticket	40
Performance Based Contract	42
3rd Party Owner	44
Distribution and Service Network Provider	46
Flexible Ownership Contract	48
PSS Procurement Strategy	50
'Easy Admin' PSS Packages	52
<b>SUMMARY</b>	<b>54</b>
Create Your Own Business Models!	58



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# THE PROTEUS INNOVATION CONSORTIUM





# INTRODUCING PROTEUS

## PREFACE

The vast majority of countries in the developed world are now dependent on their service sectors for between 70-80% of their gross domestic product. Even companies with decades of expertise in producing manufactured products are experiencing an increased need to understand before-, during- and after-sales service and have therefore embarked on business development activities that tightly combine product and service offerings in their portfolios. Closer customer contact, commoditisation of goods, total cost of ownership, and product liability are just some of the reasons for this transition. As yet there are only few systematic guidelines and instruments available to aid the development of servitised products. Therefore this series of workbooks. In this, the final workbook in the series, we focus on the ever-important question of how to create business out of our products, knowledge and competencies. Where it's relatively easy to create good ideas of ways and means to serve the customer in a different way than we do today, the big question often remains about how to transform a good idea into a sound business. By very nature, new business models cause disruption, either internally or externally in the market. This workbook provides a systematic framework for PSS business models creation and some of the considerations for new PSS business that we have made during the PROTEUS project. Although this book is written primarily for our partners on the project, we are sure it can be a source of inspiration to a broad range of practitioners, policy makers, academics and students.

**Professor Tim McAloone, PROTEUS Project Manager**

## WHAT IS PROTEUS?

The Danish Agency for Science, Technology and Innovation (DASTI) promotes and funds so-called innovation consortia, a novel constellation of research and innovation activities, involving industry, technical service companies and research institutions. The idea with innovation consortia is to promote the relationship between research and actual innovation activities in industry, resulting in both enriched research recognitions and applied industrial results. PROTEUS is one of DASTI's current innovation consortia, which focuses on the Danish maritime industry, particularly from the viewpoint of suppliers to the industry.

### THE INNOVATION CONSORTIUM'S FOCUS

The PROTEUS Innovation Consortium is working to jointly develop new knowledge about how after-sales service can be effectively integrated into business and product development in industrial organisations, so as to become a source of revenue and value, rather than a cost to the company. The company participants in PROTEUS are all from the maritime industry and are interested in understanding, through examples, how to effectively and systematically integrate service development into their product development and business creation processes.

### UNIQUE WITH RESPECT TO PSS

Current literature, tools and methods on Product/Service-Systems (PSS) include examples of procedures for the integration of product and service features in product development. However these approaches do not consider a number of key areas for business, such as the commercial considerations, the strategic organisational issues, or the possibilities of collaboration across the value chain. With its industry-wide consortium of companies, PROTEUS is in a unique position to begin to address some of these issues from a whole branch perspective.

### PROTEUS PROJECT IN DETAIL

The PROTEUS\* project is a 3 ½ year Innovation Consortium financed by the Danish Agency for Science, Technology and Innovation (DASTI). The consortium is formed by ten companies (see page 10), a branch organisation, two research institutions and an engineering consultancy. The participating companies are mainly suppliers of equipment used in ship building, operation and maintenance. Danish Maritime is the branch organisation, where most of the participating companies are represented. The research institutions are DTU Department of Mechanical Engineering and CBS Department of Operations Management. Finally, IPU Product Development supports the project with its services in engineering consulting and methodology implementation.

\* The name of the consortium, **PROTEUS**, is an acronym for the research project title: “**PRO**duct/ service-system **T**ools for **E**nsuring **U**ser-oriented **S**ervice”. It is also an apt title, as it is the name of a mythological Greek sea-god, symbol of adaptability in the face of the changing nature of the sea.

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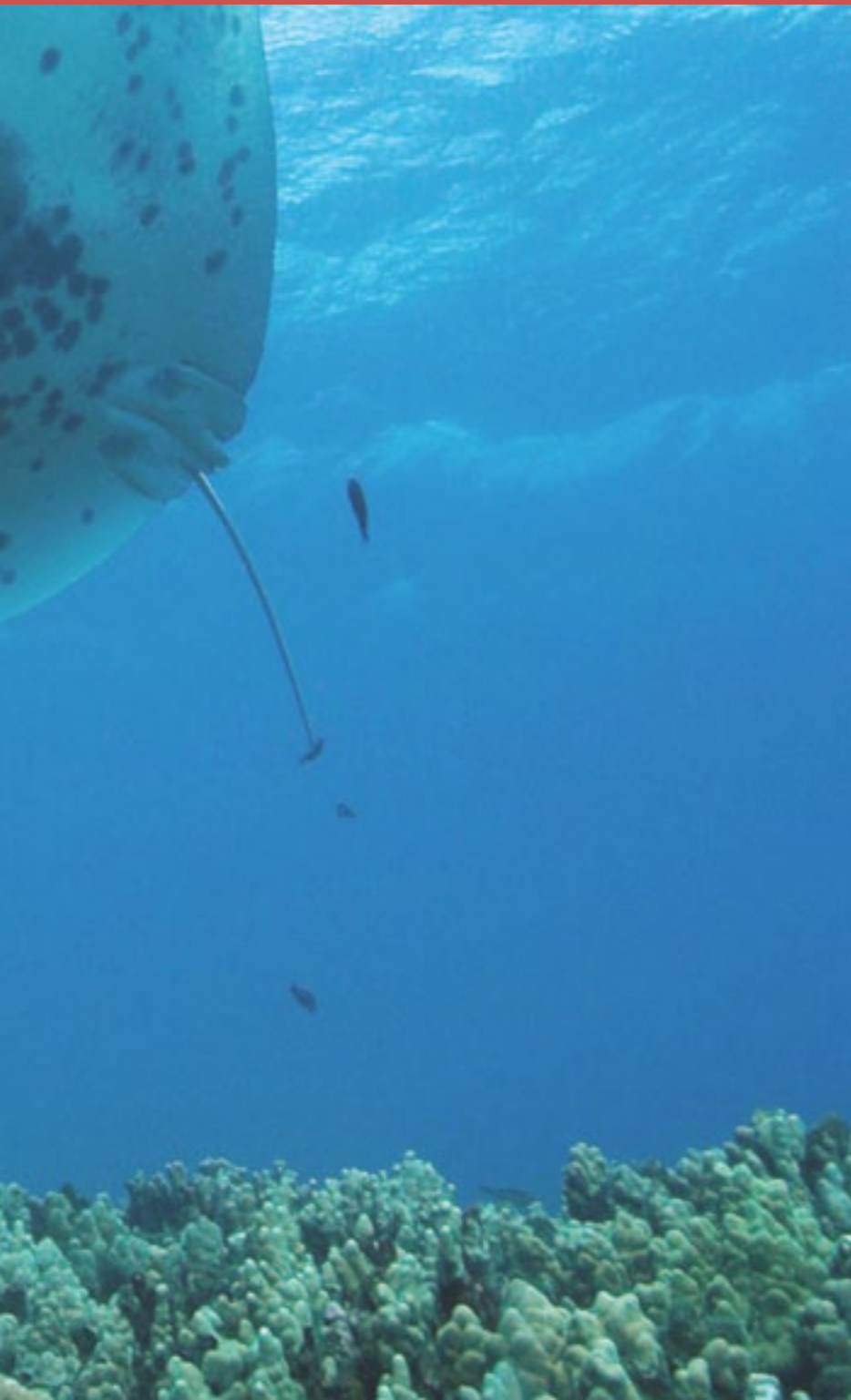
***But  
what is  
PSS?***

**PRODUCT/SERVICE-SYSTEMS (PSS)** is an innovation strategy, where a greater integration of products and services has the potential to decouple business success and economic growth from mere product sales.

Instead of viewing a product as an isolated entity, the PSS design activity focuses on creating the right combination of products and services, needed to aid the customer in reaching their goal. Incorporating service thinking into the product development process gives rise to new business opportunities; the product has the opportunity of being made more robust throughout its life cycle (i.e. it is 'Designed for Service') and the customers' entire needs and activities are considered and catered for, from the very beginning of the development process. A PSS solution does not necessarily imply that the service provider is the producer of the physical product(s) included in the PSS, but the service provider must take responsibility for the delivery of the service to the customer, including its timing, physical elements, agreements and related risks. Examples of PSS are emerging in a broad range of markets, from Business-to-Consumer (B2C), through Business-to-Government (B2G) to Business-to-Business (B2B).



NOAA's National Ocean Service. [flickr.com/photos/usoceangov/3750089506](https://flickr.com/photos/usoceangov/3750089506) (CC BY 2.0)



# MARITIME PSS BUSINESS MODELS

# BUILDING A BUSINESS ON PSS

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PSS business models have performed well in a range of industries, from air travel and defence industries to photocopiers and car paint. In all of these industries, arguments can be made for why PSS business models have shown themselves to be particularly successful: perhaps the new business models are able to cover more of the customer's needs and create value. In other cases, the PSS business model improves dialogue between the customer and supplier. Another possible argument is that the supply chain is transformed, now basing itself on mutually beneficial relationships.

Despite taking many forms, the benefits of PSS originate from one important characteristic: namely, the ability of a PSS approach of to identify inefficiencies in inter-/intra-organisational relations and provide holistically

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minded business models, addressing the identified shortcomings. In this workbook, the question is asked:

*“What constitutes an attractive PSS business model in the maritime branch?”*

In answering this question, this workbook elucidates the characteristics of the branch and its stakeholders, thus creating a basis for the provision of a number of recommendations on how maritime stakeholders can move towards a financially prosperous future, by implementing PSS business models.

The most competitive business model is likely to be the one able to offer the most value to the customer at the lowest possible price. If this model is also profitable for the supplier – i.e. no excessive costs are required in providing the mentioned value – there is a solid

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and viable basis for future commercial prosperity for supplier and customer alike. The benefits found in PSS thinking are many, but in this workbook one particular benefit is key: the ability of PSS to create a strong bond between the needs of the customer and the business model of the supplier. This ability is well documented across industries, where several instances of system-wide reformations have been observed; for instance in the refrigeration industry, the commercial aviation industry and the car painting industry. There is no reason why PSS business models cannot grow to find similar success in the maritime industry, but a number of considerations and barriers need to be treated before a move towards PSS businesses can be made. First, there needs to be a clear motivation for the industry's stakeholders to pursue PSS.



Danish Maritime. All rights reserved



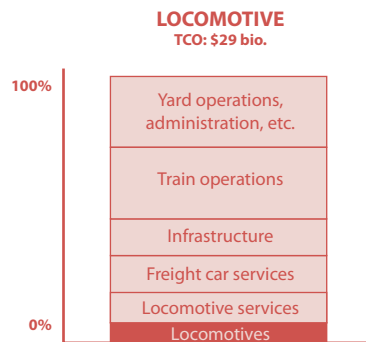
# PSS BUSINESS MODELS BENEFITS

We need to understand how the maritime customer and the supplier actually benefit from PSS. In clarifying these respective benefits, a picture of the market will be revealed in which PSS is indeed beneficial to all parties, in some cases. In other cases, the conclusion is more ambiguous.

## BENEFITS FOR THE SUPPLIER

Since its conception, PSS has been very much concerned with improving the supplier's basis for doing business. Due to this focus, there are several examples testifying to the attractiveness of a PSS business for the supplier. Such examples show that PSS suppliers enjoy larger market scopes, higher margins, longer lasting relations with the customer, improved ability to compete with low-cost entrants and a stronger knowledge of the customer

and their needs. The chart below shows an example of how large the potential can be in shifting towards offerings that support the entire life cycle of the asset.



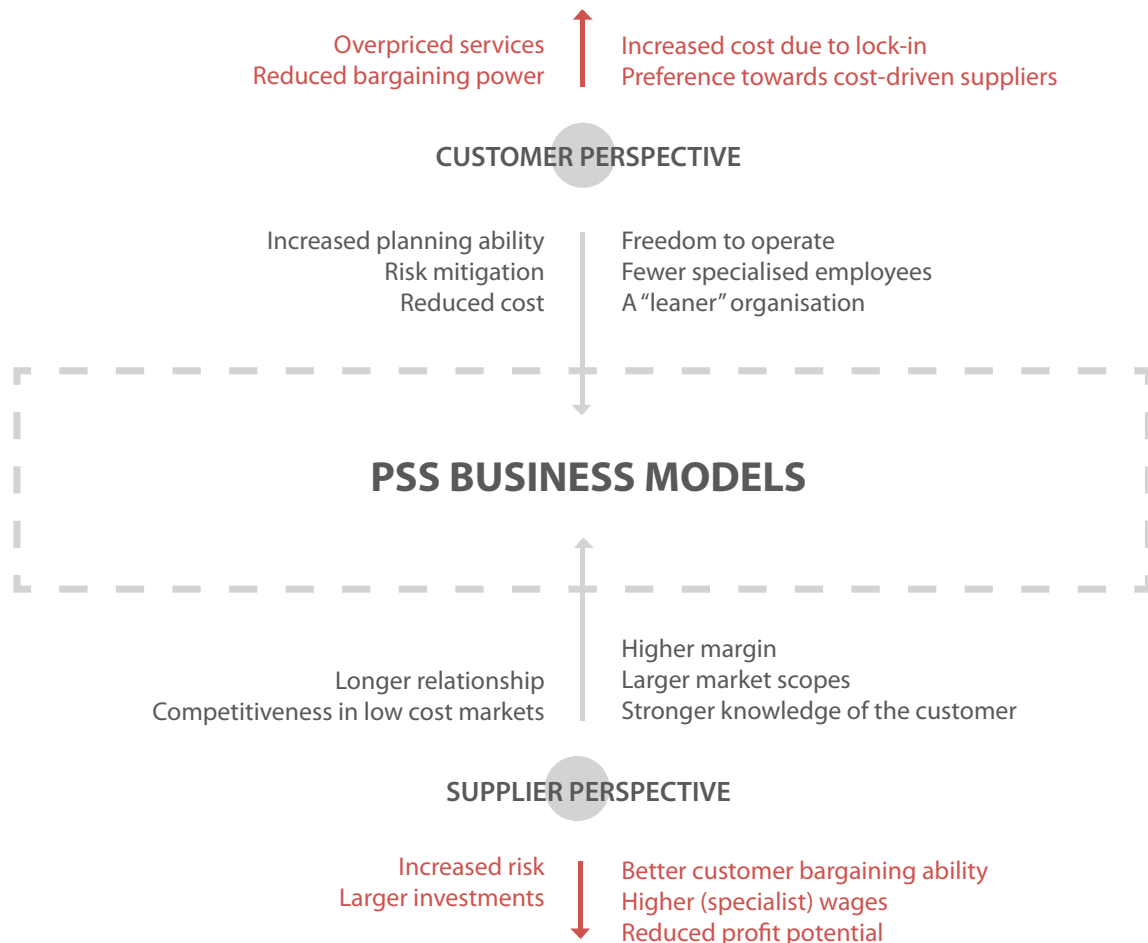
After Wise & Baumgartner, HBR, 1999

## BENEFITS FOR THE CUSTOMER

By focusing on the actual needs of the customer rather than merely on the product, a PSS is likely to perform better than traditional transactional

relationships between the customer and supplier. Examples of customer benefits from PSS business models include risk mitigation, reduced costs, increased planning ability, freedom to operate, fewer requirements for in-house competencies and a generally "leaner" organisation.

The maritime branch is, however, characterised by a number of factors that can work against these benefits. Among these characteristics are the tendency for shipowners to be active within ship brokering, the commoditisation of the supplier offerings and industry regulation. As these factors are crucial in understanding the way a customer can benefit from PSS offerings, they will be treated in detail in the later section "The Customer Perspective".



**Figure 1.** Supplier's and customer's drivers and barriers for PSS business models.

# PROFITABILITY AND BUSINESS SUSTAINABILITY

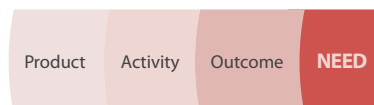
To understand the basis for value creation in PSS, one must understand some basic notions of PSS thinking. First, to explain the source of added benefits seen in PSS, the consequences of moving from a product focus to an outcome- or performance focus are discussed.

## A CHANGE IN PERSPECTIVE FROM PRODUCT TO ACTIVITY

The customer performs many different activities in executing their business. In these activities a mass of products and technologies are used. Such products and technologies are the foundation for all product-centred suppliers. As some products need maintenance, service and expertise to work properly, the product-supporting field of after-sales service has emerged. After-sales services are essentially aimed at enabling the customer to execute their

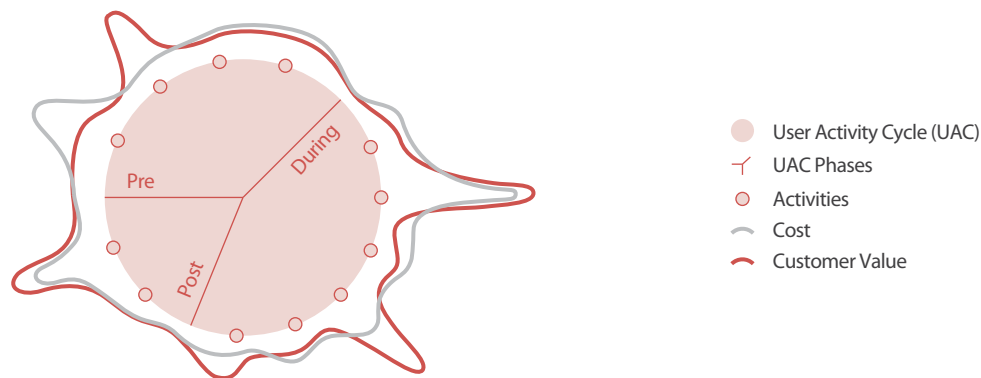
business activities in an efficient and unproblematic manner. Still, the focus is usually on supporting the product and ensuring proper function.

In PSS a step is taken, away from a traditional product-centric view and towards the activities of the customer. In fact, advanced PSS solutions take one step further and focus on the desired outcome of the customer's activities. In moving away from the product as the main offering, the supplier gets the opportunity to gain greater insight into and therefore a clearer understanding of the actual needs of the customer. Also, it will become clear that the needs observed can be supported by products, services or an integration of the two – the PSS.



Products can be seen as a technological interpretation of the customer's needs, which makes sense – as long as the interpretation is correct and useful. Many products, however, are out of tune with the actual intentions of the customer. The PSS supplier has an advantage over product-focused counterparts because of the ability to better understand and meet the needs of the customer in a dynamic manner.

As the chart on page 14 shows, the largest business potential for a supplier often lies in addressing the whole product life cycle, instead of merely focusing on product sales and distribution. Such a life cycle orientation can strengthen the competitiveness of the supplier and potentially unveil a larger turnover and profit potential. Obviously, supporting a larger share of the life cycle will almost always also lead to the supplier increasing the size



of the supporting organisation and its operations, so careful consideration must be made, regarding which areas of the organisation to strengthen. For the PSS business to be profitable, the costs involved in sizing-up must not escalate and undermine profits.

### PLANNING FOR IMPACT

In investigating the activities and realising the actual needs of the customers, the supplier is faced with another challenge – managing complexity. One advantage of the product-centric business is that it is easily defined and delimited. In a PSS, the customer's life cycle needs are the main drivers, which poses a risk that the offerings needed to support the customer will require intricate and unmanageable business models. For this reason, any PSS should be a balance between addressing as many crucial needs as possible (creating an impact) and ensuring that internal costs for supporting the offerings do not escalate. As an example, the need to support the customer globally will often lead to escalating costs.

One way of ensuring that the PSS solution developed has the biggest impact with the customer, while at the same time not being overly complicated, is to describe the customer's activities and context in a meaningful way and then map costs and ability to support onto this representation. Workbook 4 in the PROTEUS workbook series lists a number of tools that can be used to create such representations – the User Activity Cycle, the Ecosystem Map and the TCO chart.

**Figure 2.** The feasibility of supporting any customer activity relates to the potential value created (potential revenue) and the costs accrued in supporting the activity.

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# THE BUSINESS MODEL ECOSYSTEM

# MARKET STRUCTURE AND BARRIERS

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All new business models need to function in accordance with the prerequisites of their market. As with all markets, certain prerequisites seem to reoccur in the maritime branch. This section covers some of these, with the intent of forming a basis for a more informed creation of business models.

## GLOBAL SUPPORT OR NO SUPPORT

It comes as no surprise that the maritime branch is entirely global – except perhaps for regional operations such as offshore, ferries and fishing. Unlike many other industries, the main capital asset, the ship, is not stationary. In previous sections, the commercial potential in supporting the entirety of the life cycle was described – each activity can be seen as a potential point to add value and tap into new revenue streams. For non-stationary assets, this

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potential becomes significantly harder to realise, as the activities are unlikely to unfold in the same place. To capture value, the supplier needs to be able to support the vessel globally.

Whether through partnerships or through expansion of the supplier's own support infrastructure, establishing a global presence is likely to require large investments. If the customer is willing to accept a gradual rollout of the support infrastructure, the investment can be spread out. However, experience shows that suppliers with "blank" spots on their support map are less likely to win the contract.

## THE ROLE OF SHIPYARDS

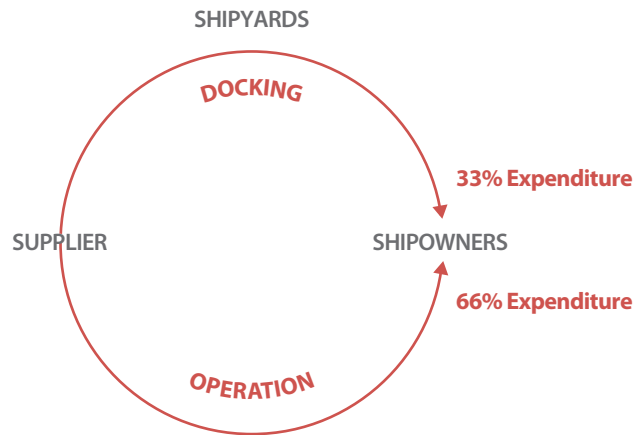
Shipyards play a fundamental role in the maritime branch, as intermediaries between the supplier and the shipowner. Here, one should bear

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in mind that the role of the shipyard is mainly relevant if the component is installed during a docking. Many smaller components can be installed without the ship having to dock.

Although not true for all technology areas, the shipyard often has a large say in which components are installed. Just as the shipowner often has a list of preferred suppliers, so do many shipyards. The shipyard's network of suppliers is likely to have specially negotiated prices and pre-agreed margins. If the shipowner is looking to move into a PSS-based contract with a supplier, this supplier's products need to be installed if not already present. To do this, the shipowner must request that the PSS supplier is favoured over the shipyard's regular suppliers. In such cases, it is common for shipyards to increase the margin on the supplier's





products reducing the financial benefit of the PSS. The transparency of shipyard margins is very low, meaning that shipowners and suppliers are not able to see the margins for particular component groups.

#### IMO LEGISLATION (BALLAST WATER TREATMENT, NOX, SOX ETC.)

The ongoing changes in international and national maritime legislation are in many cases the main strategic concern for maritime companies – both on the supplier side and on the customer (shipowner) side.

The main cause of concern has been the recent developments towards stricter environmental regulations. These include new standards for sulphur content in bunker fuels, NOx content in flue gas emissions and the amount of contaminants and microbes present in ballast water. Each of these areas require the development and installation of new technologies.

For some environmental regulations, the specific requirements are vaguely defined. This is particularly the case for the new ballast water requirements, which, at the time of writing, have yet to be ratified. Although there are many solutions to the ballast water issue, shipowners are very cautious about investing, as they could conceivably end up with the wrong technology. Even with the right technology, there is a risk that shipowners will end up not complying with the regulations, because they lack the internal competencies required to operate the newly developed systems. This creates an opportunity for suppliers to leverage their competencies in supporting the shipowner.

**Figure 3.** Share of costs relating to shipyard activities versus direct supplier- to-customer relations (based on tanker vessel).



# THE CUSTOMER PERSPECTIVE

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In this section we revisit the proposed customer benefits of PSS. As already stated, a number barriers and complexities need to be managed for PSS solutions to work properly. If a supplier succeeds in managing these issues, a whole new set of revenue streams and markets can be reached. The following describes a number of issues that have been observed in the PROTEUS consortium, through interacting with stakeholders such as shipowners, suppliers and financing institutions.

## **GENERAL PREREQUISITES FOR BUSINESS MODELS - COST DRIVER OR LONG TAIL?**

As part of the PROTEUS research project, a deep-dive was taken into the operational costs for a number of sister vessels in the shipowner TORM's fleet.

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This analysis was based on operational data from the vessels, including billings and internal costs. To concretise the analysis results, the life cycle costs were divided into different technology areas – main engine, auxiliary engine, navigation equipment, communication equipment and so forth. Below, the resulting life cycle costs (not including purchase and installation price) are listed in an indexed format, based on highest cost.

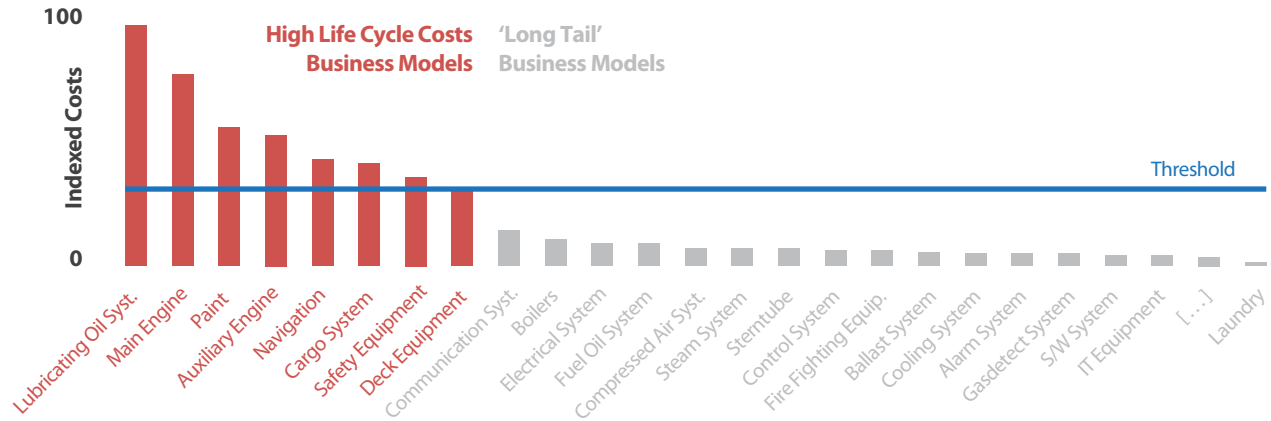
If the life cycle costs pertaining to the technology area lie above a certain threshold (as shown in Figure 4), one can say that the operation of the system is a significant cost to the shipowner. For this reason, it would make sense to pursue a technology-specific PSS business model – perhaps one focusing on increasing efficiency and cutting costs.

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If the technology falls below this threshold, it is likely that the main cost driver for the customer is administration and management of the vast undergrowth of technologies – not the operation of the system. If the supplier belongs to these technology areas, it is likely that business models that include offerings aimed at reducing the management effort for the customer will be favoured. Such a business model could, for instance, take over management activities or reduce the need for life cycle administration activities. According to the Danish Shipowners' Association, such outsourcing of administration and management activities is already a priority for many Danish shipowners.

## **BUYING AND SELLING**

Many shipowners are actively involved in ship speculation and the process of



buying and selling is in some cases a large part of the shipowner's business; in such cases any binding (service) contract or agreement standing in the way of it will be avoided. This can be seen as a bad news for PSS, as it is often related to long term, performance-oriented contracts, focusing on the entire life cycle. If the duration of ownership for the ship is shorter than the proposed PSS contract, the shipowner could face complications when trying to sell the vessel. Seeing that the time at which the ship will be sold is difficult to predict, the supplier is likely to experience a certain aversion towards long-term contracts. There are many ways to avoid such complications, for instance by anticipating them and formulating the contract accordingly.

### OWNERSHIP AND ASSET RIGHTS

In certain PSS solutions, the ownership of the product/system (asset) remains with the supplier. Instead of buying capital goods, the customer pays for the availability of the asset or for the outcome. There are a number of benefits for such a setup, such as increased liquidity due to less capital being bound in physical assets and reduced resource consumptions. In the maritime branch the vessels often have elaborate ownership constellations, including shipowners, banks and investors. For these owners, the ship itself is the collateral, in case the operation of the ship does not yield the expected result. This situation has the added consequence that the systems being mounted on the ships are seen as part of the collateral, which subsequently undermines the idea of shared or changed ownership of capital assets onboard the ship. →

**Figure 4.** The total life cycle costs for different component areas along with proposed business models (based on actual mapping of four sister-ships for TORM).

→ To make matters slightly more confusing, this integration of the asset into the collateral does not apply to all systems. For instance, a generator set used at docking is often leased from the port and returned to its owner before departure. It seems that the definition of when something is part of the ship is not very clear; this needs to be clarified if a PSS offering based on shared or transferred ownership is to be considered. The asset needs to be seen as separate from the ship, which is difficult if one is dealing, for instance, with main engines. Alternatively, the total collateral for the ship can be split, so that a small share goes to the supplier (owner). Despite the complications listed above, the Danish Shipowners' Association sees an increasing openness among their members, towards alternative ownership models.

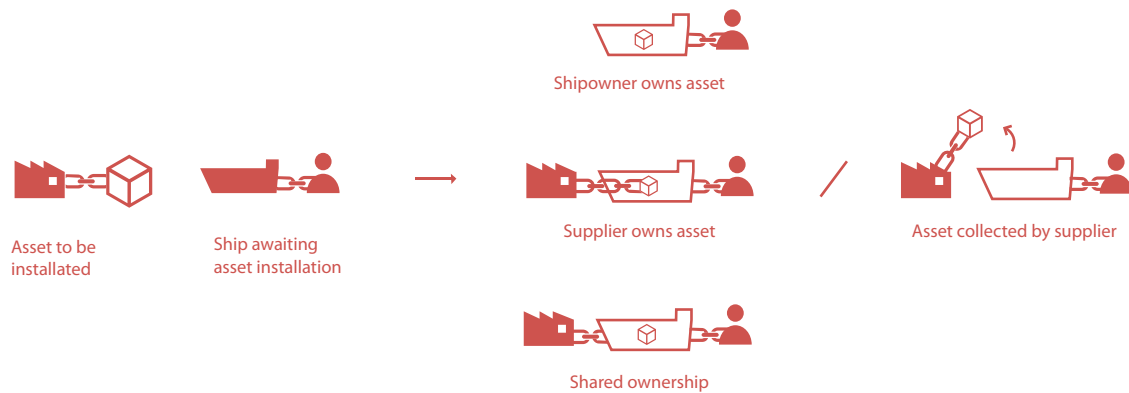
### ECONOMIC DOWNTURN

The financial crisis of 2008 had grave effects on the maritime branch. Some supplier companies and shipowners were forced to file for bankruptcy as a result of the crisis and generally, liquidity was low and uncertainty high.

Advanced offerings are often coupled with moving risk from the customer to the supplier; in doing so, the customer is likely to want assurances that the offering, along with warranties and service obligations, are reliable when faced by economic downturn or -pressure. For this reason the practice of performing an *economic due diligence*, before venturing into contracts, is becoming more widespread since the last economic downturn. In addition, the terms that had to be met by suppliers with regard to financial

solidity were sharpened. This increased tendency toward risk mitigation went both ways, resulting in reports of shipowners being refused service by suppliers, enforcing credit limits.

In some cases, the economic downturn had the complete opposite effect: As an example, the shipowner TORM was severely affected by the crisis of 2008. However, the company is now looking for new ways to do business that are more appropriate for the company's current situation. For instance, TORM has entered into an advanced, performance-oriented contract with a communication systems supplier. TORM will therefore have no expenses in purchasing the equipment. Furthermore, a future-proof and cost-efficient system is ensured, as the contract contains pre-defined technology upgrades.



### FOCUS ON THE CUSTOMER'S PRIORITIES AND METRICS

In the analysis of TORM, mentioned above, a number of other interesting findings were uncovered. The analysis revealed that the priorities of TORM in procuring products and services were much more performance-focused than one would expect. Instead of a focus on costs and financial risk, the first priority for TORM was decreasing the likelihood of a failed vetting (approval of the ship by a third party before embarkation). As a failed vetting for TORM is equal to a lost charter, worth much more than small deviations in contract cost, TORM is likely to favour the contract which, at a reasonable cost, decreases the chance of failed vettings.

In a similar analysis carried out together with another shipowner, other surprising findings emerged. The shipowner had recently invested a great deal of time and money in integrating environmental considerations into its procurement practices – unbeknown to many of its suppliers. In fact, the environmental considerations are steadily moving up on the list of procurement priorities for shipowners. Other notable examples of shipowners moving toward environmental priorities include TORM and Maersk.

**Figure 5.** Main typologies of ownerships and asset rights.

# THE ROLE OF NON-MARITIME STAKEHOLDERS

The tendency for the maritime stakeholders to stick with known business models and partners was described in the earlier sections of this workbook. In trying to understand how and where PSS business models could work in the maritime branch, one point becomes clear: the existing stakeholders and business relations are not always sufficient for supporting a new generation of resource-efficient business models. This section discusses some further difficulties facing PSS concepts and identifies 3rd party stakeholders, who could have stake in solving these.

## INVESTORS

New business models often require investments, but if liquidity is low, investments are unlikely to happen. The economic incentive is often present –

either through efficiency/performance gains or through freedom to operate (in the case of IMO legislation) – but the investments needed to reach a profitable state are beyond the means of the industry's stakeholders. As an example, the new scrubber systems emerging on the market have payback times of less than a year. Unfortunately, such systems require an investment of EUR 3-4 million per unit. Many banks are overly exposed to the maritime sector, for which reason the availability of traditional loan financing for investment and capital expenses is very limited.

PROTEUS has been in contact with Danish institutional investors (pension funds), who have shown an interest in investing into maritime business cases. In such setups, the topic of asset ownership again becomes relevant, as the investor would most likely be

interested in retaining the ownership of the system as collateral for the investment. This collateral value does not have to be based on the specific asset.

## LEASING COMPANIES

Another way for bypassing the need for large capital investment is to enter into a collaboration with a leasing company, which specialises in buying and leasing capital goods. There are several such companies in Denmark – among them are Danske Leasing, Nordania Leasing and Jyske Finans. Many of these companies have experience in entering into collaborations with equipment suppliers as a leasing partner. Unlike the case with the 3rd party investor, the leasing company needs to maintain ownership of the specific asset. Also, from a legal standpoint, it is crucial that the asset can be clearly identified and

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if necessary, removed from the vessel at any time. For this reason, the leasing company is likely to demand that the supplier assumes the responsibility for and risk of extracting systems globally, if needed.

### WARRANTY INSTITUTIONS

For an investor or a leasing company to purchase a capital asset from a supplier, there needs to be a high level of certainty that the investment will not result in losses. One way of ensuring this is to enter into an agreement with a warranty institution, able to cover a (large) share of the loss.

Some leasing companies are already working with the Danish Export Credit Agency, which is able to cover up to 80% of the original asset value, if the value is somehow lost due to bankruptcy, breakdowns, accidents etc. In return, the agency collects an insurance premium from the customer and/or the supplier.

A further way of mitigating losses and increasing the attractiveness of PSS solutions is to enter into an agreement with the Danish Market Development Fund. The fund is able to cover 60% of a loss – requiring that the supplier covers another 20%. The fund does not collect a premium in return for its guarantee, but companies must make a formal application. Furthermore, the fund only covers a finite number of system installations.







## CO-DEVELOPMENT OF BUSINESS MODELS



As described in PROTEUS Workbook <sup>5</sup>, the transition from a product-oriented business to a PSS-oriented business can be a long and arduous journey. There are many ways to mitigate the negative aspects of such a transition – many of which have already been covered in Workbook <sup>5</sup>.

In this section an important factor in succeeding with the transition to PSS is discussed – that of co-developing business models with the customer. For discussions and learnings on suppliers co-developing PSS solutions, read Workbook <sup>6</sup>, which focuses on PSS partnerships.

In suggesting co-development, the intention is not to imply that such an activity is always possible or even feasible. Rather, the point is that for a novel business model to succeed,

the utmost effort must be put into aligning the intended solution with the customer. The recommendations below can also be seen as useful in strengthening the dialogue between the customer and the supplier.

### SETTING THE STAGE

The first crucial point to consider when initiating a development dialogue between the shipowner and supplier is whether the proposed subject for dialogue is indeed interesting for both parties. Many propositions have failed to succeed because they merely addressed areas of interest for one of the involved parties. In PROTEUS, such failed attempts at novel business setups have been observed, coming from both the supplier and the customer.

By looking at the general market characteristics and the observed needs of the suppliers and customers, a lot can

be realised with regard to framing the dialogue. With reference to the section of this Workbook describing general prerequisites for business models, there is little meaning in proposing a comprehensive and elaborate PSS solution, if the life cycle costs of the system in focus are part of the “long tail” of technology areas. In that case, the ambition of the dialogue should be to find new ways through PSS of reducing the administration costs for the shipowner, perhaps by covering other component areas and including other suppliers. Many of the previous sections of this book can be used to the same effect – i.e. framing the dialogue between the parties.

### SHARED UNDERSTANDING BASED ON TOOLS

At this point in the workbook series, the complexities of PSS are likely to be clear

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to the reader. For this reason, the life cycle and ecosystem for the customer, the quantification of costs and benefits, and the planning of organisational change, all require meaningful representations and tools. To aid the PSS developer in this process, the PROTEUS team has created an entire workbook, focusing only on tools, the Workbook <sup>4</sup>. The tools presented in that workbook should not only be seen as internal to the organisation; in fact, a large part of the tools' value lies in their ability to strengthen and streamline communication between stakeholders of different backgrounds, by providing a common ground for discussion. In co-developing a new business model, the customer and supplier can benefit significantly from using the Business Model Canvas (see next section), the User Activity Cycle and Ecosystem Map. In PROTEUS, a number of case studies have applied the above tools in a co-development process. These case studies have all shown that the tools can be very useful in identifying differences in understanding and opinion. The tools have the effect of aligning the understanding of needs and activities, thus improving the basis on which new business models are developed.

### FINDING THE RIGHT DATA – MAKING AN INFORMED DECISION

Up until this point, the considerations on co-development have been qualitative in nature. The dialogue with maritime stakeholders and experiences from previously successful – and also failed – PSS cases underlines the need for quantitative measures in creating viable and mutually attractive business models. By mapping costs, risks and other relevant quantities on to the →

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→ activities in the life cycle, the parties are able to pinpoint the truly attractive PSS solutions.

For this to work, the parties need to be willing to share data relevant to the addressed life cycle phases. It is highly likely that both the supplier and the shipowner have data unknown to the other party. The shipowner is likely to have better access to operational life cycle data and the supplier is likely to have a better access of the pre-commissioning part of the life cycle.

At this point it should be noted, that sharing data is in no way an easy deed, as conflicts of interest can often occur. In fact, the notion of sharing data is a source of controversy in the maritime branch (as with many other branches) as an asymmetry of knowledge is often seen as a way of improving the bargaining position for negotiating

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parties. For instance, some suppliers are unwilling to share data about actual time expenditure on service activities, as this might lead to demands for lower service pricing. Conversely, shipowners can sometimes have an interest in downplaying the cost and importance of certain required services, as this would improve the bargaining position of the service provider.

### THE MUTUAL BENEFIT CONTRACT

When a business model concept that seems attractive to all parties has been set up, this can be used as a starting point for formulating the operational representation of the business model – the contract. In many cases, a PSS contract will assume the form of a so-called Service Level Agreement (SLA).

Experiences with representing business models by creating SLA prototypes

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indicate that the points of the contract should first be represented in a non-technical language, to enable discussion across departments and organisations. Moving too quickly to strict legal formulations will often make the contents unattainable to the people affected by the contract. In discussing the points of the prototype contract, the parties should attempt to describe areas of potential conflict and try to formulate terms that are of mutual benefit.

Only when the points of the contract have been formulated in a way that is understood and accepted by the relevant and affected parties, should the legal version of the contract be drafted.

### A NOTE ON ROLLOUT

The topic of Workbook 5 in the PROTEUS workbook series is the difficult transition from product-provider to

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PSS-provider. If an advanced, performance-based and integrated PSS solution is to succeed on the market, large investments of time and other resources are needed in both its conceptualisation and in constructing the business model through which the solution should operate.

This is a barrier for both supplier and customer, hoping to be the sole beneficiary of a new business model. For this reason, the co-development setting is optimal in order to not only deciding on how the business model should be formulated, but also how it should be rolled out. The PSS Configurator introduced in Workbook 4 can be used to describe a portfolio of offerings, needed for a business model. In discussing the rollout of the business model, the parties could also discuss how the gradual implementation of the singular offerings could be achieved, in a way where each step is profitable and practical for both supplier and customer. For instance, if the advanced PSS business model requires a call-centre to be set up as one of its necessary offerings, the parties could investigate how such a call-centre, by itself, can be turned into a mutually beneficial offering.

Such stepwise and feasible rollout strategies are not at all realistic in all cases. In considering the possibilities the parties can, however, be fortunate and identify steps that decrease the risk and required investments in transitioning towards PSS.



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# A CATALOGUE OF PSS BUSINESS MODELS

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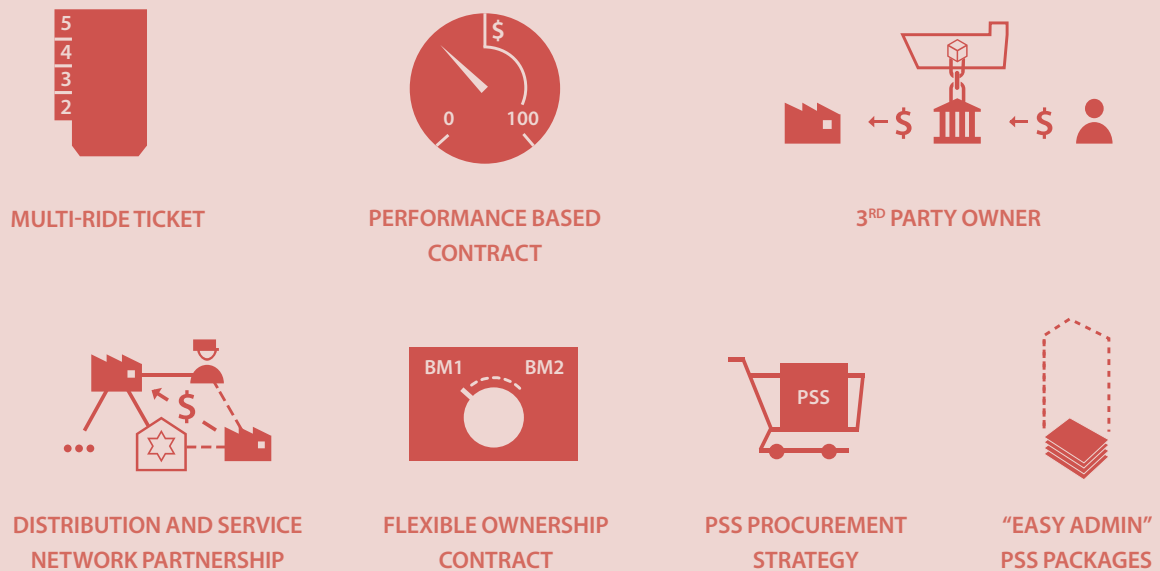
In this final part of the workbook a number of business model concepts are presented. Each of these concepts attempt to address a specific current situation in the maritime branch and provide a solution to this situation, through a business model. The models have been created by the PROTEUS research team, in collaboration with the PROTEUS consortium's partner companies and 3rd party stakeholders.

The business models presented here remain at a conceptual level, for two reasons. Firstly, further evidence is needed to formulate the specifics of the models. Secondly, the models are not meant to be “one-size-fits-all”. Rather, they are meant to be sources of inspiration (and provocation) for maritime companies, looking to venture into new ways of doing business.

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## DESCRIBING BUSINESS MODELS

The Business Model Canvas (BMC) has been chosen as the template for describing business model concepts in the catalogue. The main reason for this choice is that the BMC has found great success across industries, meaning that the reader is more likely to know and be able to follow the format. Also, the canvas provides an easy to understand and efficient way of describing the workings of a business model. Below, the canvas and its elements are described in more detail. The BMC describes a business model by dividing it into its elements. Each element is directly linked to the adjacent elements. These linkages reveal the internal workings of the model and help the business model creator to understand the consequences of different choices. In the following page, each element is described.



**Figure 6.** Catalogue of PSS Business Models.



**KEY PARTNERS**

There are good reasons to in-source areas of importance to the competitive advantage. However, in many cases this is not practically feasible or even logical. Most business models are likely to require a number of key partners, in order to function well. This is another way of saying that the company will often need to compete on its value chain.

**KEY ACTIVITIES**

Just as key resources can be crucial for the competitiveness of the company, so can its activities. When functioning well, activities such as development processes and procurement practices can be a source of above average productivity and below-average costs.

**KEY RESOURCES**

In delivering a value proposition, the company is most likely required to draw upon certain key resources – be they human, intellectual, technological or something else. These resources can be a source of competitive advantage for the company if they are difficult to replicate.

**COST STRUCTURE**

Maintaining the internal resources, the key activities, the partnerships and providing the value propositions is bound to be a costly affair. The Cost Structure lists all the costs involved in creating value for the customer. The profitability of the business model is determined by comparing the cost structure with the revenue streams.

**PRODUCT AND TECHNOLOGY**

*One weakness of the BMC as described in its classical form is its lacking ability to describe the importance of technology in the business model. In principle, this topic could be described in the Key Resources element, along with a mass of other topics. The Danish maritime suppliers are generally characterised by high levels*

**VALUE PROPOSITION**

For each customer segment, certain offerings are likely to be seen as valuable – these offerings are called value propositions. The value proposition is likely to change from one customer segment to another. The value propositions element of the BMC contains a list of all the offerings in the company's portfolio.

**CUSTOMER RELATIONSHIPS**

Offerings are transferred by different means to the customer to create value. In the other direction, intelligence such as customer feedback, operational data etc. is gathered by way of customer relationships. These communications are crucial in ensuring a proper formulation of the value propositions.

**CHANNELS**

To actually create value, the offerings listed under Value Propositions need to be transferred to the customer through a distribution network or by non-physical means, such as the internet. These different modes of transferring value to the customer are the channels.

**CUSTOMER SEGMENTS**

For a company to conduct its business in a meaningful way, it must know who the customer is. Furthermore, it is also crucial to know who the customer is not and what the difference is between certain groups of customers. These characteristics are described as customer segments.

**REVENUE STREAM**

In return for creating value for the customer, the supplier is rewarded in different ways. The Revenue Streams element of the canvas describes these sources of income.

*of expertise within their respective technological areas. This characteristic should be leveraged in current and future business models. To better capture the role of technology in the business model, this workbook has added a new element to the Business Model Canvas – the Product and Technology element.*

## MULTI-RIDE TICKET



**PROBLEM.** There can be a potential in venturing into more elaborate contracts between supplier and customer. However, such contracts often mean that customers need to commit to a certain supplier and its services. Furthermore, it is exceedingly difficult to capture every contingency in a contract meaning that claims between the parties are more likely to occur.

<b>KEY PARTNERS</b>  To ensure a consistent basis for providing the chosen instance (a PSS package), there could very well be a need for utilising partner’s global platforms – either through mutual exchange or through subscription.	<b>KEY ACTIVITIES</b>  Due diligence before contract engagement – is there a basis for a set price or is the customer/ market too disordered? The company also needs to develop products and services that are flexible in deployment across the market.  <b>KEY RESOURCES</b>  An organisation aimed at delivering specific packages in an efficient and consistent way.	<b>VALUE PROPOSITION</b>  A number of offerings packages that can be purchased at a reduced price of a ticket is bought for more than (say) five instances.
<b>COST STRUCTURE</b>	The organisation, portfolio and sourcing strategies will be optimised toward delivering certain, standardised packages that fit into the multi-ride concept. This should lead to lower overall costs and an improved ability to budget precisely.	
<b>PRODUCT AND TECHNOLOGY</b>	For the business model to make sense, there must be a meaningful “instance” of products and services. This PSS package should be formulated in a way so that it can be easily provided at a consistent cost.	

**SOLUTION.** The customer and supplier are likely to have certain combinations of products and services transacted between them more often than other combinations. For such reoccurring offering-packages, the parties could consider a “multi-ride ticket”, where a price is set up-front for a certain number of instances within a given time period. This contract should be flexible in the sense that the remaining “clips” on the ticket should be usable on other vessels. One could even consider making the instances (one or more) tradable between shipowners. For the shipowner, such a “multi-ride” setup improves the basis for cost planning. For the supplier, the formulation gives a certainty that a certain number of offerings-packages will be grossed in a given period. If only some of the instances are used before the end of the contract period, the supplier will compensate the customer.

	<b>CUSTOMER RELATIONSHIPS</b>  As current relations. The multi-ride contract will however be an added dimension to interactions.	<b>CUSTOMER SEGMENTS</b>  Shipowners in need of more consistent costs in addressing re-occurring needs.
	<b>CHANNELS</b>  The normal distribution and service channels of the supplier – perhaps strengthened by partnership channels.	
<b>REVENUE STREAM</b> The revenue is gathered through predetermined payments for the “multi-ride” packages. The revenue in each instance will be smaller than for a single sale, but there will be much greater certainty with regard to the revenue collected over time.		
Also, it should be formulated so that it is flexible to (or insensitive to) outside factors – for instance vessel type, vessel condition and global location.		

## PERFORMANCE BASED CONTRACT



**PROBLEM.** The shipowner does not necessarily have the competencies or knowledge needed to integrate new technologies on vessels. In many cases it is not practically or economically feasible to invest in such competencies, as they diverge too much from the core business of the company. Furthermore, the need for the technology might not always be present, meaning that in-house competencies will be utilised to a low degree. Conversely, the suppliers are specialists in the technologies and their operation. If a shipowner is faced with new regulations on ship performance – for instance with regards to ballast water treatment - the supplier is often much more capable to address those needs.

<b>KEY PARTNERS</b>  If the supplier is to hold the responsibility for any contract breaches (including the costs of the ship being off-hire), it is likely that a 3rd party warranty institution is needed.	<b>KEY ACTIVITIES</b>  Operational excellence within systems.  Ability to operate systems on vessels globally positioned.	<b>VALUE PROPOSITION</b>  A no-hassle solution, where (almost) all dimensions of integrating a technology are outsourced.
	<b>KEY RESOURCES</b>  Ongoing monitoring and control of installed systems. Development of systems appropriate for remote/efficient operation.	
<b>COST STRUCTURE</b>  The step from product organisation to an organisation based on performance or outcome offerings is huge and it is likely that the mass of new interfaces with the customer will require large investments and significant operational costs.		
<b>PRODUCT AND TECHNOLOGY</b>  If the supplier is to service the system during operation, the design needs to take into account the continuous relocation of the vessel and the changing prerequisites for applying services and		

**SOLUTION.** In areas that fall outside of the core competencies of the shipowner’s organisation, the supplier can choose to provide an outcome or performance based offering. Here, the supplier is in charge of the entire operation of the system and the services needed to achieve a certain performance measure or outcome – e.g. thresholds for microbes in ballast water. The supplier also holds the responsibility for any violations of the agreed performance thresholds.

<div><div>CUSTOMER RELATIONSHIPS</div><div>The communication between the system on the vessel and the supplier is crucial – either through satellite communication or supplier presence on the vessel.</div></div>	<div><div>CUSTOMER SEGMENTS</div><div>Shipowners looking to focus on core competencies and outsource the planning, implementation and operation of new technological solutions.</div></div>
<div><div>CHANNELS</div><div>The performance oriented offering requires the ability to support the system throughout its life cycle. This requires a strong distribution and service network – perhaps through partners.</div></div>	
<div><div>REVENUE STREAM</div><div>Revenue is gathered based on performance. If relevant, above-expectation performance outcomes can be coupled to bonus agreements.</div></div>	
<div>maintenance. This could mean an increased level of process automation and the addition of new sensors to remotely monitor the system.</div>	

### 3<sup>RD</sup> PARTY OWNER



**PROBLEM.** The limited liquidity with both shipowners and suppliers is a barrier for investments into new technologies, which could improve energy efficiency, reduce running costs and lower environmental impact.

#### KEY PARTNERS

The new legal entity (buyout fund) will have control of the asset. New investments (vessels) will be identified by the this entity in cooperation with the supplier(s).

#### KEY ACTIVITIES

Identification of attractive vessels (see “Key Partners”) and maintenance of installed systems. Also, the development of self-contained systems that can be dismantled and re-installed is key.

#### VALUE PROPOSITION

Subscription based (performance or availability) technology acquisition.

Flexible contracts allowing for quick buy-in or buy-out.

#### KEY RESOURCES

Knowledge of how to operate the asset in a cost-effective and low risk manner.

#### COST STRUCTURE

Instead of having to respond to the customer’s somewhat randomly occurring needs, the supplier can plan service and maintenance of several, similar systems at once. This enables economies of scale and better budget planning.

#### PRODUCT AND TECHNOLOGY

For 3rd party ownership to be possible, the system needs be as self-contained as possible. The more it is integrated into the vessel, the more problems will occur, when defining whether it is indeed part of the ship.

**SOLUTION.** Engage 3rd party capital investors such as pension funds. These institutions invest into new legal entities able to procure, install and own the necessary equipment. This could for instance be a so-called “buyout fund”, which would have a mandate to procure and own a finite number of assets of a specific type. The buyout fund collects its revenue by collecting a performance or availability-based subscription from the shipowner. To ensure proper operation of the asset and to minimise technical risk in the investment, the supplier of the asset and supporting services can be given the task of maintaining and servicing the equipment.

	<b>CUSTOMER RELATIONSHIPS</b>  Feedback systems (electronic and inter-personal) are crucial for maintaining the system.	<b>CUSTOMER SEGMENTS</b>  Shipowners looking improve performance and reduce OPEX, but without the ability or willingness to invest the necessary capital in the required technologies.
	<b>CHANNELS</b>  The suppliers' service centers and distribution network. Also, the buyout fund is likely to interface with other suppliers, whose networks can be used.	
<b>REVENUE STREAM</b>  Based on either performance of the system or the availability of the system, the shipowner pays the buyout fund a pre-defined subscription. Part of this revenue is then passed on to the supplier.		



DISTRIBUTION  
AND SERVICE  
NETWORK PROVIDER



**PROBLEM.** Larger suppliers in the maritime branch typically have an extensive network of distribution and service channels. This enables such suppliers to support a larger share of the customer’s life cycle. On the other hand, smaller suppliers have a need for infrastructure if they are to compete with other suppliers within the same area. It is however practically and financially next to impossible to establish the necessary infrastructure.

<b>KEY PARTNERS</b>  For a company to pursue this business model, it must have a large, well established business platform. To further increase coverage and reach, the company could consider teaming up with other suppliers with an extensive network.	<b>KEY ACTIVITIES</b>  Development of network capabilities and development of network based offerings.	<b>VALUE PROPOSITION</b>  Infrastructure availability including supporting assets and services.
	<b>KEY RESOURCES</b>  The supplier’s distribution and service network. A flexible and scalable, electronic platform for establishing, managing and operating agreements with client suppliers.	
<b>COST STRUCTURE</b>	As the platform is already necessary and active for providing the company’s own products and services, the company incurs only limited added costs. Most of the costs are related to managing the platform and for more advanced features such as training.	
<b>PRODUCT AND TECHNOLOGY</b>	The technical dimensions of this business model primarily relate to establishing a proper understanding of what the network is able to support and where it has limitations. It is likely that the network is	

**SOLUTION.** Larger suppliers provide access to their service and distribution network under standardised terms and in return for collecting a fee for making the network available. This network service can be in the simple form of facilities, but in more advanced versions, it could include standardised platforms for training the network owner’s personnel in providing services for another (paying) supplier’s products. This is essentially a PSS to enable other suppliers to implement and support their own PSS.

	<b>CUSTOMER RELATIONSHIPS</b>  Feedback from the customer (the suppliers) regarding which features are missing in the network. Perhaps using the electronic platform, mentioned under Key Resources.	<b>CUSTOMER SEGMENTS</b>  Suppliers in need of a global network and presence, but lacking the resources to establish such a platform.
	<b>CHANNELS</b>  The platform is a channel in itself. The sales object is the availability, which does not require channels.	
<b>REVENUE STREAM</b> Payment for network availability – either as a flat rate or as a “per-use” model. For the supporting features, the “per-use” model is appropriate.		
technically most suitable for 3rd party suppliers with products similar to those of the network provider.		

# FLEXIBLE OWNERSHIP CONTRACT



**PROBLEM.** Normally for the customer, capital bound in physical assets is seen as locked and unavailable for financing the ongoing capital- and operational expenses. In many cases, the ownership of an asset is necessary to ensure the ability to sell the vessel. If the asset is owned by a supplier or 3rd party, the process of selling the ship can be complicated. From another perspective, the costs of the shipowner vary year by year, depending on fleet age, docking cycles etc. This variation requires different financing options for ensuring the operation of the company.

<b>KEY PARTNERS</b>  There could be a need for a financing partner (investor) as the supplier is unlikely to be able to handle ownership of a large number of assets. Perhaps a warranty institution could be of relevance.	<b>KEY ACTIVITIES</b>  Handling of the continuous process of buying and selling assets within contracts.	<b>VALUE PROPOSITION</b>  A two-sided contract enabling the customer to move capital from CAPEX to OPEX (and back) when needed.  <i>Note: This model works for a number of different system types, which each have their own specific value proposition.</i>
	<b>KEY RESOURCES</b>  Knowledge of the life time depreciation in asset value and increase in maintenance costs (for contract creation).	
<b>COST STRUCTURE</b>  Two cost structures: (1) Production and distribution costs. (2) Costs for buying back assets from customer and servicing the asset		
<b>PRODUCT AND TECHNOLOGY</b>  If the contract between the parties stipulates, that the shipowner takes ownership of the asset in the event of a ship sale, the asset does not have to be designed for easy removal. However, certain scenarios		

**SOLUTION.** A contract in which the ownership of the asset can be moved at any given time to the supplier (and back again) at a cost determined during the original contract negotiations. In this case, the company can quickly and easily sell the asset back to the supplier if there is a need to free capital. In return, the supplier will receive a fixed rate, monthly payment for availability – the price of which has also been determined in the original contract negotiation. This could, for instance, be in order to free liquidity for a high number of dockings. At a later stage, the shipowner might wish to reduce the operational costs by dropping the monthly subscription and buying the asset back – again at the price originally determined by the contract. In either case, the supplier collects an attractive revenue from the shipowner. This business model adds a financial degree of freedom to the shipowner’s operations, making it interesting -not only for the technical- and procurement divisions, but also for the financial department.

	<p><b>CUSTOMER RELATIONSHIPS</b></p> <p>A “contract switching” communication platform. Continuous monitoring of asset.</p>	<p><b>CUSTOMER SEGMENTS</b></p> <p>Shipowners looking for new financial instruments to improve the efficiency of the company’s operations – partly by reducing the need for outside financing.</p>
	<p><b>CHANNELS</b></p> <p>Current channels for selling and distributing products.</p>	
<p><b>REVENUE STREAM</b>      Two options represented in the same contract: (1) Selling products without service commitments. (2) Collecting revenue from premium subscription for availability of asset owned by supplier.</p>		
<p>could necessitate an asset that can easily be removed – for instance if the supplier wants to leave the contract and maintain ownership. In any case, the asset should be monitored to ensure proper operation and, if necessary, adjust the estimated asset value and subscription costs.</p>		

PSS PROCUREMENT STRATEGY



*Note that this particular idea is centred on the shipowner. It describes a procurement strategy within the bounds of the Business Model Canvas, which does not necessarily cover all dimensions pertaining to procurement and supply chain management.*

**PROBLEM.** PSS business models are normally put forth by the supplier as a way to increase value creation for the customer and cover a larger share of the customer’s activities. The benefits of PSS have, however, now been acknowledged by some shipowners. Nevertheless, these shipowners have currently no basis for procuring PSS solutions from their suppliers.

<b>KEY PARTNERS</b>  In many cases, the supplier is the best partner in procuring the right solution as the is likely to have additional data and relevant information regarding the system of interest.	<b>KEY ACTIVITIES</b>  Identification of areas in need of PSS support. Interaction (co-development) with supplier in finding solution. Ongoing monitoring of systems running under PSS contract.	<b>VALUE PROPOSITION</b>  Potentially: Improved flexibility, lower costs and less time in off-hire.
	<b>KEY RESOURCES</b>  A strong model/understanding of the operations for which PSS solutions are procured.	
<b>COST STRUCTURE</b>  Increased share of flexible costs and reduced amount of redundant costs, due to performance and outcome based supply chain contracts. Less capital is bound in physical assets.		
<b>PRODUCT AND TECHNOLOGY</b>  For a PSS procurement strategy to work, the shipowner must establish a basis for pinpointing activities and technological areas of interest. To do this, new data must be gathered from existing systems. This		

**SOLUTION.** Formulation of a PSS procurement strategy for shipowners (and potentially suppliers in relation to sub-suppliers). The customer has superior access to operational activities and their data. Therefore, the customer is in the best possible position to propose new ways supporting its business processes. These PSS solutions can start internally by identifying relevant areas, based on quantitative measures. From there, a dialogue can be initiated with the supplier on how these critical activities can be supported. This enables the customer to co-develop efficient solutions with the relevant supplier and create mutually beneficial contracts. The Danish Shipowners' Association has expressed an interest in investigating PSS procurement strategies.

	<div>CUSTOMER RELATIONSHIPS</div> <div>Not relevant for PSS Procurement Strategy.</div>	<div>CUSTOMER SEGMENTS</div> <div>Not relevant for PSS Procurement Strategy.</div>
	<div>CHANNELS</div> <div>Not relevant for PSS Procurement Strategy.</div>	
<div>REVENUE STREAM</div> <div>Not relevant for PSS Procurement Strategy.</div>	<div>can be achieved by adding sensors or to purchase new equipment with sensors included. These same sensors will enable the shipowner to monitor the performance of the PSS supplier after the contract has been signed.</div>	

## "EASY ADMIN" PSS PACKAGES



**PROBLEM.** Shipowners are faced with a vast undergrowth of non-critical components and systems that are not costly with regard to purchase- and service costs. Instead, the administration of these "long tail" components' life cycle draws significant costs.

<p><b>KEY PARTNERS</b></p> <p>The coordination between the package suppliers is crucial to create an attractive and coherent offering and to effectively handle the supporting services.</p>	<p><b>KEY ACTIVITIES</b></p> <p>Coordination of package sales and support efforts. The single point of entry company also has important activities in coordinating and planning tasks.</p> <p><b>KEY RESOURCES</b></p> <p>A platform for sharing product data, service guidelines and for coordinating supporting services is a central prerequisite for a package solution.</p>	<p><b>VALUE PROPOSITION</b></p> <p>Simplified procurement and after-sales relationships through integrated PSS package solutions.</p>
<p><b>COST STRUCTURE</b></p> <p>Costs will be placed in different supplier companies, depending on where the service is carried out and by whom. For this reason, the PSS package cooperation needs to feature a cost-sharing mechanism.</p>		
<p><b>PRODUCT AND TECHNOLOGY</b></p> <p>The packages should be formulated based on meaningful technological delimitations – for instance the categories used in the analysis of TORM vessels. Otherwise, it will be less obvious to the shipowner, which particular package it is dealing with. Furthermore, the elements of the package should be</p>		

**SOLUTION.** Suppliers collaborate to formulate packages of components and systems. These package are coupled to a service agreement, covering the life cycle activities and needs of the system. The customer has a single point of entry when needing assistance or service for any item within the package. The suppliers involved in the package share platforms in supporting it and each company's service personnel are trained to carry out services and maintenance on other suppliers' systems.

	<b>CUSTOMER RELATIONSHIPS</b>  The customer engages with the suppliers through a single point of entry.	<b>CUSTOMER SEGMENTS</b>  Customers facing excessive costs in administrating the “long tail” (non-critical, low-cost) of vessel systems.
	<b>CHANNELS</b>  The combined distribution and service network of the package suppliers should be used to install, commission and support the package.	
<b>REVENUE STREAM</b>  The customer pays for goods and services to the same organisation (single point of entry). This organisation, in turn, passes an appropriate share of the revenue on to the supplier partner, who incurred the cost. The remaining income is distributed across the partners in the PSS package.		

serviceable, using competencies present in all the supplier companies. This last requirement could require tweaking of existing designs or actual development of new designs.



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# SUMMARY

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In the beginning of this workbook, the following question was posed:

*“What constitutes an attractive PSS business model in the maritime branch?”*

It should be clear though that there is not one single, specific answer available to the question. The attractiveness of a given PSS business model is likely to depend on a number of complex factors, including the economic situation of the shipowner, the type of technology, the legal requirements and many others.

We therefore encourage you and your organisation to use the learnings from the whole workbook series in creating new innovative PSS business models. Consider aspects of partnership, both with your customer and also with

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other suppliers. Remember that your organisation will have to alter, in order to expand to the augmented activities of product and service delivery that you’ll be taking on. Bear in mind the tools you have at your disposal and the framework for PSS development that we’ve proposed. But first and foremost, remember to assess, whether your company, the industry sector and the customer-base are ripe for such a change, from product- to product/service-based value creation.

Good luck with your servitisation activities!



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## References

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Originals of material attributed to PROTEUS can be found online at [www.dtu.dk/proteus](http://www.dtu.dk/proteus)

## CREATE YOUR OWN PSS BUSINESS MODEL!

### KEY PARTNERS

*Need any partners, investors, warranty institutions, infrastructure providers etc.?*

### KEY ACTIVITIES

*Which activities are needed for executing and sustaining the business?  
Development, monitoring, proactive sales?*

### KEY RESOURCES

*What do you need to have in your organisation to excel? Human resources, patents, knowledge?*

### COST STRUCTURE

*Supporting a life cycle can be expensive – is your organisation focusing on the most attractive life cycle activities and needs?*

### PRODUCT AND TECHNOLOGY

*What are the technological implications of the proposed business model? Does the product need to be easier to remove, monitor, repair etc.?*

<div>VALUE PROPOSITION</div> <div>What is the value your company provides for the given segment?</div>	<div>CUSTOMER RELATIONSHIPS</div> <div>Will the relationship with the customer change? Is there a need for improved communications throughout the life cycle?</div>	<div>CUSTOMER SEGMENTS</div> <div>Who is your customer and how do the customer's needs vary over time? Also, what is the difference in needs between customers?</div>
	<div>CHANNELS</div> <div>Supporting the whole life cycle means new channels. What are yours?</div>	
<div>REVENUE STREAMS</div> <div>How will you collect revenue from a larger part of the life cycle? Through subscriptions, performance fees, sales or maybe through sales to an intermediate investor?</div>		







This final book in the PROTEUS Innovation Consortium's seven-book series describes the background for new PSS business models in the maritime branch. The aim of the workbook is to improve the suppliers' understanding of the opportunities in the market and inspire them to create new business models by providing a number of innovative PSS business model concepts.



**The Technical University of Denmark**  
Department of Mechanical Engineering  
Anker Engelundsvej 1, 101A  
DK-2800 Kongens Lyngby



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